INDOOR AIR QUALITY ASSESSMENT

South Egremont School
42 Main Street
South Egremont, MA

Prepared by:
Massachusetts Department of Public Health
Bureau of Environmental Health
Indoor Air Quality Program
September 2018

BACKGROUND

Building:	South Egremont School (SES)
Address:	42 Main Street South Egremont, MA
Assessment coordinated via:	Juliette Haas, Health Director, Egremont
Reason for Request:	Assessment for general indoor air quality (IAQ) concerns and lead paint
Date of Assessment:	August 23, 2018
Massachusetts Department of Public Health/Bureau of Environmental Health (MDPH/BEH) Staff Conducting Assessment:	Michael Feeney, Director, IAQ Program
Date of Building Construction:	This building was originally constructed in 1881
Building/Site Description:	This building is a two-room schoolhouse with a peaked roof
Building Population:	This building is used by approximately 20 people, including students in pre-k/kindergarten and staff
Windows:	Openable

METHODS

Please refer to the IAQ Manual for methods, sampling procedures, and interpretation of results (MDPH, 2015). No air testing was conducted as the building was not occupied during the visit.

RESULTS and DISCUSSION

Ventilation

The SES has no installed mechanical ventilation. Both rooms have grills that appear to be connected to a forced hot air heating system. Ductwork and mechanical systems were not installed at the time of this assessment. Windows in the building open to provide fresh air.

Microbial/Moisture Concerns

A water-damaged ceiling tile was observed in one room. This water damage is likely from a leak in the chimney/roof junction and does not appear to be recent. Wall-to-wall carpeting was found to be water-stained around the entrance of the front room.

Carpets should be cleaned annually (or semi-annually in soiled/high traffic areas) in accordance with Institute of Inspection, Cleaning and Restoration Certification (IICRC) recommendations, (IICRC, 2012). The service life of carpeting is approximately 10-11 years (IICRC, 2002). As noted, carpeting was observed to be worn and stained. Carpeting of this age and condition becomes increasingly difficult to clean and maintain and may be a source of particulate matter to the indoor environment. Regular cleaning with a high efficiency particulate air (HEPA) filtered vacuum in combination with an annual cleaning will help to reduce accumulation and potential aerosolization of materials from carpeting.

Of note is the condition of the crawlspace. Cement on the western side of the crawlspace appears to be wet (Picture 1), which can be attributed to water penetration through the foundation. On the west wall of the building is a newly constructed staircase, which appears to have seams that may allow water to penetrate through the foundation. In addition, downspouts from the roof appear to empty into cement splash blocks (Picture 2). In Picture 2, the splash block appears to be tilted *towards* instead of *away* from the foundation, which would allow for water to gather along the foundation.

It is recommended that downspouts direct water at least five feet away from the base of the foundation. The ground area at the foundation should be covered with a water impermeable material (e.g., clay) that is sloped away from the foundation at a rate of 1 foot height by 5 feet in length so that rainwater shed off walls will drain away from the foundation.

Other IAQ Evaluations

As part of the assessment, concerns were raised with regard to the condition of paint that may contain lead in the building. According to test results, lead paint was found on window sills, window frames and chair rails. IAQ staff noted that window sills, window frames and chair rails were covered with a heavy coat of material and no paint chips or flaking was noted on any of these materials. The building has undergone a number of renovations since it was originally

constructed. Several layers of paneling exist over walls, which would render the original walls inaccessible. A building like the SES would be classified as a child occupied building under the current Massachusetts lead paint laws [M.G.L. c. 189A a.k.a. Lead Law). The Lead Law requires the removal or covering of lead paint hazards in residences (defined as premises) built before 1978 where any children under 6 live (MDPH, 2018). The Lead Law requires proper remediation efforts for child occupied buildings.

> The department shall also, in consultation with the director, adopt regulations specifying licensing requirements and safety procedures to be used by all persons employed in performing renovations or rehabilitation in a residential premises or child-occupied facilities in a manner that disturbs paint, plaster or other materials containing dangerous levels of lead. [M.G.L. c 197B(c)].

Pursuant to this requirement, the MA Department of Labor Standards (MDLS) promulgated the document "Operation & Maintenance Guidelines for Public Buildings with Lead-based Paint" (MDLS, 1996), which is included with this assessment as Appendix A. In this document, it is recommended that a building operator adopt the following housekeeping practices if lead-paint is present:

1. Lead-contaminated dust can be generated by the friction of painted surfaces. Windows, sills, stools and troughs are likely areas for this type of lead-contaminated dust accumulation.
2. The recommended housekeeping procedure is periodic damp wiping or wet cleaning of areas such as those mentioned above. Horizontal surfaces (e.g., floors, stairs) where children play frequently should receive special attention.
3. Increased efficiency vacuum cleaner bags are advertised by many manufacturers for use with normal vacuum cleaners. Their use is recommended as a reasonably inexpensive precaution for routine cleaning where no lead based paint (LBP) chips or dust are present, though no scientific data currently exist to verify the manufacturer's advertising claims. If HEPA vacuum equipment is available, its periodic use for normal cleaning is strongly recommended. (MDLS, 1996).

During this assessment, a cleaning contractor was observed cleaning the building interior, including wet wiping of flat surfaces, which would be consistent with recommended MDLS housekeeping practices.

CONCLUSION AND RECOMMENDATIONS

In view of the findings at the time of the visit, the following recommendations are made:

1. Continue to following the recommended MDLS practices detailed in the guideline "Operation & Maintenance Guidelines for Public Buildings with Lead-based Paint" (Appendix A).
2. Replace water-damaged wall-to-wall carpeting.
3. Repair holes/seams in the building envelope, such as in the side steps, to prevent water accumulation in the crawlspace.
4. Consider extending downspouts at least five feet from the foundation.
5. During occupied periods use openable windows for fresh air. Ensure they are tightly closed when the building is not occupied to prevent moisture and pest infiltration. Ensure openable windows have intact screens to prevent pest entry.
6. Refer to resource manual and other related indoor air quality documents located on the MDPH's website for further building-wide evaluations and advice on maintaining public buildings. These documents are available at http://mass.gov/dph/iaq.

REFERENCES

MDLS. 1996. MA Department of Labor Standards (MDLS) promulgated the document "Operation & Maintenance Guidelines for Public Buildings with Lead-based Paint".

MDPH. 2015. Massachusetts Department of Public Health. Indoor Air Quality Manual: Chapters I-III. Available at: http://www.mass.gov/eohhs/gov/departments/dph/programs/environmental-health/exposure-topics/iaq/iaq-manual/.

MDPH. 2018. Massachusetts Department of Public Health Lead Paint Laws [M.G.L. c. 189A].

Picture 1

Moisture in the west side of the crawlspace

Picture 2

Downspout emptying at base of foundation onto splash block

APPENDIX A

Operations & Maintenance for Public Buildings with Lead-Based Paint

OPERATIONS & MAINTENANCE GUIDELINES FOR PUBLIC BUILDINGS WITH LEAD-BASED PAINT

The purpose of this pamphlet is to introduce the main components of the safe management of lead-based paint encountered during the routine maintenance of public buildings, especially schools. Examples of such activity include repair of a damaged section of a wall, installation of an electrical outlet or repair of a window.

In such a short space, however, this publication can only summarize the principal topics. It cannot provide the detailed guidance necessary to develop and implement an adequate plan for the management of lead-based paint. For further assistance, see the resource section at the end of this pamphlet.

USES OF LEAD-BASED PAINT

Before the 1970s lead-based paint was commonly used in public buildings and residences. Workers can have very high lead exposure from removing paint from surfaces previously coated with lead paint, such as in building repair, residential renovation and deleading, and demolition. In the construction field, lead is also used for roofs, tank linings, and electrical wiring.

HOW DOES LEAD AFFECT THE BODY?

Lead poisoning has been a serious health concern for centuries. Even though much is known about lead and how it can affect your health, lead poisoning is still very common today.

Workers can be exposed to lead by breathing in lead dust or fumes from work activities, by eating, drinking or smoking in work areas, or by handling contaminated objects - and accidentally swallowing lead dust. Workers in many workplaces have so much lead in their bodies that they are slowly being poisoned. The symptoms may hardly be noticeable at first. But over time, lead can damage the brain, blood, nerves, kidneys and reproductive organs. This damage can cause serious disability: memory loss, extreme tiredness, emotional problems, even kidney failure, coma or death.

Young children are especially affected by lead. Improper work practices can cause lead dust to contaminate areas beyond the immediate work area and poison young children. Lead dust can also collect on employees' work clothes during the day. When those clothes are worn home, the lead can contaminate workers' cars and homes. Young children can then be poisoned by the lead-contaminated dust.

Lead poisoning can occur when people are exposed to large or small amounts of lead over time. Lead builds up in the body and may cause temporary or permanent damage. A blood lead test can show whether your body has absorbed a dangerous amount of lead. A high blood lead level is an indication that lead is building up in the body faster than it can be eliminated.

WHAT IS AN O&M PROGRAM?

In the course of maintaining and repairing a building, workers engage in a variety of activities that may disturb lead paint or other lead products. In order to protect both employees and occupants, these activities must be managed in a manner that eliminates or minimizes lead exposure. An essential element in the in-place management of lead is a lead "operations and maintenance" (O&M) program. A lead O&M program is a set of procedures and work practices that should be followed during routine building maintenance and cleaning.

ESSENTIAL ELEMENTS OF AN O&M PROGRAM

A written O&M program describes, in detail, the procedures to be followed in minimizing lead exposures during routine maintenance and cleaning. The program should cover the following material:

1. **LEAD PROGRAM MANAGER** One person should be designated to manage the lead-based paint O&M program. This person should be trained in lead hazards and in specific requirements for operations and maintenance activities around lead-painted surfaces. The designated person's name, title, and phone number should be listed in the O&M program.

2. **SURVEY RESULTS** Testing for the presence of lead-based paint is recommended for all suspect surfaces. All lead inspection or survey results should be part of the O&M. Program. X-Ray Fluorescence (XRF) reports, laboratory analyses results, spot-testing results, field sheets, and field notes should be organized in a section of the document. Survey results should be easily accessible for reference. LBP surfaces should be visually inspected periodically depending on conditions. This section should be updated when additional lead surveys are performed.

The survey results provide a description of the location of lead-based paint. An easy way to compile these results is to mark the locations on construction (as-built) drawings. The location of LBP should be updated as new survey results are obtained and when LBP is removed. Any enclosures around LBP should also be noted on the construction drawings.

3. **GENERAL PROCEDURES AND WORK PRACTICES** The General Procedures and Work Practices which apply to the site should be included in a separate section of the O&M program. The procedures and work practices for specific tasks can be removed from the O&M program and used by maintenance workers in performing O&M activities.

4. **TRAINING** All worker training must comply with federal, state and local requirements and should be documented in the O&M program. Documentation requires placing copies of training certificates, class rosters, and course outlines in a section of the program. The section should be updated as additional training is completed.

O&M PROGRAM MANAGEMENT

In managing lead-related tasks the Lead Program Manager should assure the completion of the following:

1. **SCHEDULING** O&M work activities disturbing lead-based painted surfaces should be scheduled through the Lead Program Manager. A major scheduling issue has to do with the need to relocate building occupants. Ideally, work areas should be vacant while LBP O&M work is taking place.

2. **NOTIFICATION OF OCCUPANTS** Building occupants should be informed of the presence of lead-based paint and hazards associated with it. Occupants should understand the importance both of not disturbing lead-based paint and of reporting the presence of chipping/flaking paint or visible dust and debris.

Occupants should be notified prior to the start of lead-based paint O&M work affecting areas they use. Occupants should receive advanced notice when relocation will be necessary.

3. **TRAINING** The work practices are intended to minimize lead exposure both to workers and to building occupants. Workers should not undertake any of these tasks, however, without having a basic understanding of the hazards of lead, the measures needed to protect themselves and others from lead exposure, and at least the minimum training required by law.

In addition, state and local regulations should be consulted.

4. **RECOMMENDED HOUSEKEEPING PROCEDURES** Lead-contaminated dust can be generated by the friction of painted surfaces. Windows sills, stools and troughs are likely areas for this type of lead-contaminated dust accumulation. Exterior lead-contaminated dust may also be tracked into and accumulate on and around entryways.

The recommended housekeeping procedure is periodic damp wiping or wet cleaning of areas such as those mentioned above. Horizontal surfaces (e.g., floors, stairs) where children play frequently should receive special attention.

Increased efficiency vacuum cleaner bags are advertised by many manufacturers for use with normal vacuum cleaners. Their use is recommended as a reasonably inexpensive precaution for routine cleaning where no LBP chips or dust are present, though no scientific data currently exist to verify the manufacturer's advertising claims. If HEPA vacuum equipment is available, its periodic use for normal cleaning is strongly recommended.

5. **WORK PERMITS** The Lead Program Manager should issue a work permit before any lead-related maintenance is performed, either by building employees or outside contractors. This procedure is used to determine the presence of lead before work begins and to ensure that appropriate protection and work practices are used.

6. **WORK PRACTICES** Appropriate work practices must be used that minimize the generation of lead dust or fume and prevent the contamination of surrounding areas.

7. **PERSONAL PROTECTIVE EQUIPMENT (PPE)** Employers must ensure that service workers are provided with and trained to use appropriate PPE.

8. **EXPOSURE MONITORING** Exposure to lead should be determined in the course of work. Where possible and/or necessary, dust sampling should be performed before allowing areas to be occupied.

9. **MEDICAL SURVEILLANCE** O&M workers should be tested periodically to ensure that they are medically able to wear respirators and to measure their blood lead levels.

10. **RECORD KEEPING** Complete records, such as work performed and training, should be kept of all O&M activities.

Resources:

Organizations

Department of Labor Standards
617-626-6960 or 508-616-0461

National Institute for Occupational Safety and Health
4676 Columbia Parkway
Cincinnati, OH 45226
(800) 356-4674

Publications

Lead-Based Paint: Operations & Maintenance Work Practices Manual for Homes and Buildings. A detailed guide on development and implementation of an O&M program, available from:
The National Institute of Building Sciences
Publications Department
1201 L Street, NW, Suite 400
Washington, DC 20005
Tel. (202) 289-7800; Fax (202) 289-1092

Protecting Workers and Their Communities from Lead Hazards: A Guide for Protective Work Practices and Effective Worker Training. A book on lead in construction with chapters on O&M work practices and worker training, available from:
Society for Occupational and Environmental Health
6728 Old McLean Village Drive
McLean, VA 22101
Tel. (703) 556-9222

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